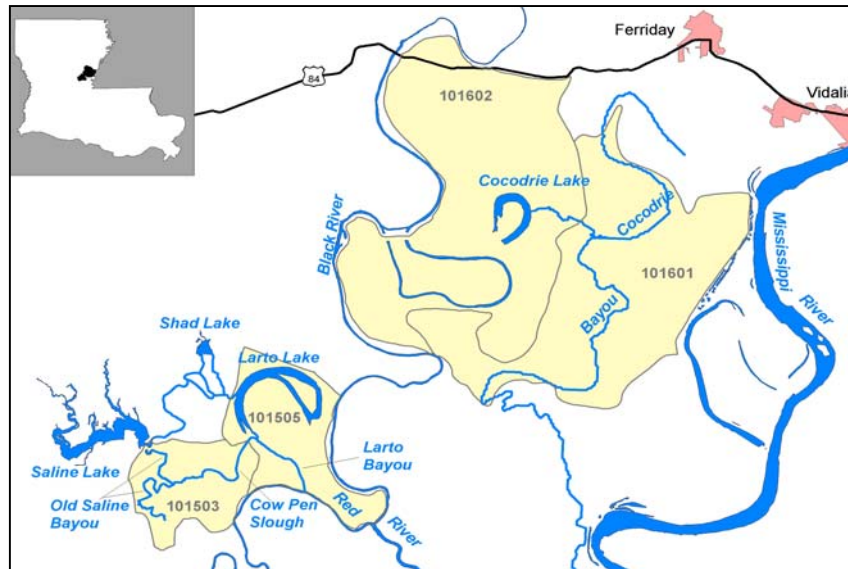


## TMDLS FOR TURBIDITY, SULFATE, AND TDS FOR SUBSEGMENTS 101503, 101505, 101601, AND 101602 IN THE RED RIVER BASIN, LOUISIANA Fact Sheet



**Figure 1. Location of impaired subsegments in the Red River Basin included in this report**

Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's Water Quality Planning and Management Regulations (Title 40 of the *Code of Federal Regulations* [CFR] Part 130) require states to develop Total Maximum Daily Loads (TMDLs) for waterbodies that are not meeting water quality standards. A TMDL establishes the amount of a pollutant that a waterbody can assimilate without exceeding its water quality standard for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and nonpoint sources to restore and maintain the quality of the state's water resources.

A TMDL for a given pollutant and waterbody is composed of the sum of individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background levels. In addition, the TMDL must include an implicit or explicit margin of safety (MOS) to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody, and may include a future growth (FG) component.

This report presents TMDLs that have been developed for turbidity for Old Saline Bayou (subsegment 101503), Bayou Cocodrie (subsegment 101601), and Cocodrie Lake (subsegment 101602); and turbidity, sulfate, and total dissolved solids (TDS) for Larto Lake (subsegment 101505).

All of these subsegments are located in the Red River basin in eastern central Louisiana. Old Saline Bayou (subsegment 101503) is located north of Marksville, Louisiana. The watershed of this subsegment is 24 mi<sup>2</sup> and is primarily cropland. Larto Lake (subsegment 101505) is located just east of the Dewey W. Mills Wildlife Management Area. The watershed for this subsegment is 33 mi<sup>2</sup>, primarily in cropland, and wetlands. Bayou Cocodrie (subsegment 101601) is located southwest of Ferriday, Louisiana. The watershed of this subsegment is 99 mi<sup>2</sup>, predominantly in cropland. Cocodrie Lake (subsegment 101602), is located between Bayou Cocodrie and the Black River.

These water bodies were included on the Louisiana Department of Environmental Quality (LDEQ) final 2004 303(d) list as not supporting their fish and wildlife propagation and, for Bayou Cocodrie, outstanding natural resource waters designated uses, and were ranked as priority #1 for TMDL development. Natural conditions were identified as suspected causes of impairment for three of the subsegments. Crop production was identified as the suspected cause of impairment for Bayou Cocodrie. The numeric water quality criteria that apply to the impaired subsegments in the Red River Basin and that were used to calculate the total allowable pollutant loads are shown below in Table 1.

**Table 1. Water quality standards for impaired subsegments included in this report.**

Subsegment Number	Subsegment Name	Impaired Use <sup>A</sup>	Parameter Causing Impairment	Suspected Source of Impairment	Numeric Criteria from Standards
101503	Old Saline Bayou	FWP	Turbidity	natural conditions <sup>b</sup>	25 NTU
101505	Larto lake	FWP	Sulfate	natural conditions <sup>b</sup>	10 mg/L
		FWP	TDS	natural conditions <sup>b</sup>	165 mg/L
		FWP	Turbidity	natural conditions <sup>b</sup>	
101601	Bayou Cocodrie	FWP, ONR	Turbidity	Irrigated and non-irrigated crop production	25 NTU
101602	Cocodrie Lake	FWP	Turbidity	natural conditions <sup>b</sup>	25 NTU

Notes: A. DWS = Drinking Water Supply, FWP = Fish and Wildlife Propagation, ONR = Outstanding Natural Resource Waterway

B. Water quality standard use attainability analyses needed

These TMDLs were developed using a load duration curve method. This method determines allowable pollutant loadings for the range of measured streamflow conditions. There are four steps for applying this methodology. First a flow duration curve is developed using flows observed at a USGS flow gage on the impaired stream or as close as possible to it. Next the flow duration curve is converted to a load duration curve by multiplying the measured flow by a target concentration. The target concentration most often is a water quality standard (as in the case of TDS and sulfate). A target concentration for TSS (for which there is no water quality criterion) was estimated from the turbidity criterion using linear regression relationships between TSS and turbidity measured in the subsegments. In the third step observed loads (calculated by multiplying a measured pollutant concentration by the stream flow for that day) are plotted with the load duration curves made in step two. Percent reductions required to meet water quality criterion (or associated targets) are determined by reducing the measured concentrations until the observed loads are all less than the load duration curve value associated with the same flow. Finally the TMDL, MOS, FG, WLA and LA are calculated based on the reduced loads.

In TMDL development, allowable loadings for all pollutant sources are determined so that they add up to no more than the TMDL. WLAs account for permitted point source discharges. None of the subsegments had any point sources permitted for the pollutants addressed in these TMDLs. The LAs include background loadings and human-induced nonpoint sources. An explicit MOS of 10 percent (for the sulfate and TDS TMDLs) and a FG component of 10 percent (for all the TMDLs) were also included. For the TSS TMDLs the MOS was implicit based on several assumptions, the most significant being treating TSS as a conservative parameter (i.e. assuming it does not settle out). A summary of the TMDLs for each of the subsegments is presented in Table 2.

**Table 2. Summary of TMDLs for subsegments in this report.**

Parameter	Subsegment Number	Subsegment Name	Loads (tons/day)					Percent Reduction Needed
			WLA	LA	MOS	FG	TMDL	
turbidity(all expressed as TSS)	101503	Old Saline Bayou	0	2.09	impl	0.23	2.32	81%
	101505	Larto Lake	0	3.06	impl	0.34	3.40	71%
	101601	Bayou Cocodrie	0	10.06	impl	1.12	11.18	87%
	101602	Cocodrie Lake	0	13.29	impl	1.48	14.77	82%
TDS	101505	Larto Lake	0	0.91	0.11	0.11	1.13	20%
Sulfates	101505	Larto Lake	0	14.94	1.87	1.87	18.68	59%

## For More Information

EPA seeks input on this proposed TMDL, including comments, information, and data from the general and affected public. For additional information on this TMDL project, please contact the EPA staff listed below:

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